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Full Length Research

Studies on Ethnoveterinary Practice in Ruminants in Ekiti State, Nigeria

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A survey was conducted in Ekiti State on ethnoveterinary practice used in rural areas against parasitic diseases of ruminants. A questionnaire was used for the survey among the rural people and pastorals. The result revealed the effect of socioeconomic characteristics such as age, sex, marital status, educational status, religion and occupation on the ethnoveterinary practice by the rural people of Ekiti State. The rural people should be more educated on how to improve on the use of traditional method to treat diseases to provide better health care for the animals. The most common diseases of goat in Ekiti State include mange and diarrhea. A total of 51 plants were observed to be in used by the people of Ekiti State. These plants came from 28 families. The various ethnoveterinary practice used in the study includes: palm oil, medicinal plants, cold water, hot ash, palm kernel oil, sand from stream water, kerosene, fire, Locust bean to treat diseases such as mange, respiratory diseases, neck problem, lameness, lice, diarrhea, parasite in the hoof, swollen body, mouth problem and so on. The government should fund research to test the findings (validation) in this study to further clarify them. And there should be biodiversity conservation.

Key words: Ethnoveterinary practice, validation, biodiversity conservation, pastorals, medicinal plants, socioeconomic characteristic.

INTRODUCTION

Livestocks serves as a source of animal proteins that are utilized for human consumption, to provide good health and growth of human beings. It also helps to improve the economy of the country, through supply of meats, hide and skin and so on. However, there are some hindrances to this supply of vital nutrients to human beings from animal. These includes, havoc caused by pests and diseases, poor management and so on. There is increase in high cost of modern drugs for rural people to reduce this effect of pests and diseases. But another remedy has being introduced, which is the use of ethnoveterinary practice to cure ruminants diseases.

Ethnoveterinary practice is the use of indigenous knowledge to treat diseases of ruminants. Indigenous knowledge can involve the use of medicinal plants and herbal medicines. Ruminants are animals that have four stomach such as omasum, obdamsum, reticulum and rectum. Examples include cattle, sheep, goat and ram.

Ethnoveterinary practice is being practiced in Ekiti state (Kolawole *et al*., 2007). It is being used to treat diseases such as mange (scabies) and mouth foaming. But the use of ethnoveterinary practice in some specific places in Ekiti State still need to be investigated. Pastorals depend on ethnoveterinary medicine because of their sedentary nature, they are usually far away from modern veterinarians (Rahmatullah *et al*., 2010).

The use of medicinal plants is currently playing a significant role in treating ruminant diseases because it reduces cost and helps to eliminate side effects and resistance to the parasites caused by synthetic drugs. Medicinal plants had been used to treat parasitic diseases such as diarrhea, pile, cold and ectoparasites such as mange, tick, lice and fleas. This is due to the active Ingredients or principles contained in each of these plants. In which synthetic drugs are being made from.

Parasites are the major causes of diseases in

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ruminants. Parasites can be grouped into endoparasites and ectoparasites. Endoparasites are parasites found inside the animal and they include nematode (round worm), cestodes (tapeworm), Fluke (liverfluke) but nematode is the most common one affecting rumimants causing diarrhea. While ectoparasites are parasites found outside the animal and they include tick, lice mange and fleas. These parasites can be treated using medicinal plants (McGaw and Eloff, 2008).

Ethnoveterinary survey enables us to know the medicinal plant that can be used to treat parasitic disease (Nalule *et al*., 2003).

Medicinal plants had been used in various places for treating cattle diseases such as Kenya. In South Africa, the ethnoveterinary practice including medicinal plants have been shown to be used to treat cough, wounds, skin diseases, mild diarrhea and reproductive disorders (McGaw and Eloff, 2008) . The medicinal plants used have been shown to have antibacterial activity (McGaw and Eloff, 2008). In Pakistan, 77 ethnoveterinary practice comprising 49 medicinal plants have been used for treatment of parasitic diseases like tick and lice infestation, mange, myiasis and helminthiasis (Farooq *et al*., 2008). Ethnoveterinary practice has varying aspects such as economic, socio-cultural, biochemical, environmental magico-religious (Wanzala *et al*., 2005). The various ethnoveterinary practice used in previous studies such as ash, water, kerosene, plants, palm oil (Nnadi *et al*., 2012).

Socioeconomic characteristics of some people in certain places like Ekiti State, Imo State, Southwest Nigeria have been investigated (Kolawole *et al*., 2007; Nnadi *et al*., 2012; Mafimisebi *et al*., 2012), but there is paucity of information regarding this in this part of the country, hence the study is designed to survey ethnoveterinary practice in ruminants and socioeconomic characteristics of the people in the area.

METHODOLOGY

Field Survey in Ekiti state

Survey of ethnoveterinary practice and socioeconomic characteristics of the people was carried out in Ekiti state located on longitudes 4° 20´ and 5° 40´ East of the Greenwich meridian and between latitudes 6° 20´ and 8° 10´ North of the equator. Ekiti state is divided into 3 senatorial districts: Ekiti North, Ekiti South and Ekiti central. Scattered settlement pattern is dominant; while some remote areas have nuclear and linear settlement patterns. Most of the population are Christians while Muslims and Traditionalist form the minority. The major occupation of the people is farming while few people engage in other activities such as trading, weaving, sewing etc[1]. About nine local government areas in the 3 senatorial districts were selected: Oye, ikole and Ido local government (Ekiti North), Ikere, Ise orun and Emure local government (Ekiti South), Efon Alaaye, Ijero and Ado local government (Ekiti central).

The Local Government Areas were selected based on the areas where they have not being previously studied before and based on easily accessible areas within the LGA. Three communities were chosen from each LGA. From each community, 15 people were selected for interview by simple random sampling. People rearing small and large ruminants were contacted for the study. Information were gathered from the people using questionnaire and open ended interview. The socioeconomic characteristics of the people were determined by asking the people to indicate them and their responses were recorded. An interview schedule with open ended questions was used to identify the medicinal plants used, information on pests and diseases of ruminants, medicinal value of each medicinal plants and method of administration of medicinal plants through key informants interviews and focus group discussion (FGDs).

The socioeconomic characteristics were analyzed using frequencies and percentages. Pastorals involved the use of cattle management and these cattle were ravaged most importantly by the diseases called Anaplasmosis. Cattle owners in Ado- Ekiti were visited and interviewed with the use of questionnaire to provide information on ethnoveterinary management of cattle in Ekiti State

RESULTS AND DISCUSSION

Socioeconomic Characteristics of the Farmers in Ekiti State

Age

The results in Table 1 show that a greater proportion of the rural peoples practicing ethnoveterinary practice were within the age range of 36-50 years, this agrees with the findings of Nnadi *et al*. (2012). This shows that they will still be agile and have strength to take care of the animals. It infers that the study areas were dominated by farmers who were still in their active ages and can thus engage actively in agricultural production. The age could still make them to be able to carry out further research on ethnoveterinary practice.

Sex

Table 1 showed that majority 78.5% of the people in Ekiti-State practicing ethnoveterinary practice were female while the remaining 21.6% were male. The female had the highest percentage in rearing animal, which can be

Table 1. Socio-economic characteristics of respondents in Ekiti State.

Socioeconomic characteristics	Frequency	Percentage (%)
Age		
≤20	0	0
21-35	9	6.7
36-50	70	52
51-65	37	27.4
≥66	19	14.1
Sex		
Male	29	21.5
Female	106	78.5
Marital Status		
Single	17	12.6
Married	83	61.5
Widow	33	24.4
Divorced	2	1.5
Educational Status		
No formal education	83	61.5
1-6 (Primary education)	21	15.6
7-12 (Secondary education)	18	13.3
13-18 (Tertiary education)	13	9.6
Religion		
Christianity	118	87.4
Islamic	14	10.4
Traditional healer	3	2.4
Occupation		
Trading	86	63.7
Sewing	12	8.9
Professional Teaching	14	10.4
Farming	23	17.0

mean that they will have more time to care of the animal since they were always at home to do house work since most of them are not educated. This agrees with the findings of Osho and Fasina (2013) in Ekiti -state.

Marital status

The marital status distribution of the people in Table 1 shows that majority (61.5%) of the people practicing ethnoveterinary practice were married.

Educational Status

The result in Table 1 shows that a greater proportion 61.5% of the people had no formal education while the remaining 15.6%, 13.3% and 9.6% had primary education, secondary education and Tertiary education. Majority of the people in Ekiti State practicing ethnoveterinary practice were married people. This agrees with the findings of Kolawole *et al*. (2007) and Nnadi *et al*. (2012). This means that their will be division of labour and complementarities of efforts in information supply, decision making and farm labour supply as husband, wife and children were involved.

Religion

The result in Table 1 shows that a greater proportion of the people practicing ethnoveterinary practice 87.4%

were Christians. Majority of the people practicing ethnoveterinary practice in Ekiti State were christains and less of Islamic and traditional worshippers. This agrees with the study of Kolawole *et al*. (2007). This means the rate of herbalist using charms were low, but most people believed on the most high God.

Occupation

The result in Table 1 shows that a greater proportion 63.7% were traders and 10.4% were professional teachers. Majority of the people practicing ethno-veterinary practice were traders in the markets or around their different houses and probably most males were farmers going to farms and less of professional teachers in the local areas of Ekiti State.

Diseases Affecting the Ruminants in Ekiti State and the Traditional Treatment

Different locality of Ekiti-State have some medicinal plants that are peculiar to their areas e.g. *Hymenocadia acida* in Oye, *Khaya senegalensis* in Ikere, *Aspilia Africana (*Eriara or yunrinyun) in ikere, *Thaumatococous danielii* in Efon alaye, *Panguetina nigrescens* and olo in Ido and so on. They also have some specific name they call some ruminant diseases e.g Jabe (pile), guyan (mange), ewu/ekiku (mange), akeperan (botulism) and so on. The different plants and diseases specific for a particular location of Ekiti State can be due to differences in climatic factors such as rainfall, temperature, wind and so on, which can affect the distribution and availability of medicinal plants and occurrence of diseases in ruminants and in the area.

Pests and Diseases of Ruminants in Ekiti State

Field observation revealed that most of the respondents in the study area were more familiar with the common pests and diseases affecting the animals. Lice, ticks and mange /scabies were pest identified in the study area (Table 2). The pests affect skins and hairs of the animals. Some like ticks suck the blood of the animal. Mange appeared to be the most common pests in these study areas. It causes serious havoc to the skin of the animal caused by mites which eat up the hair on the skin of the animal. This pest caused great economic loss to the skin of the animal by causing disvalue to the affected animal. It can be treated using:

i. Shaft of palm kernel seed to scrap the body.
ii. It can also be treated using emi ojo grind and add kerosene and use husk of maize to rub the body.
iii. Roasted water yam mixed with something can be used to scrub the body of the affected goat with mange.
iv. Palm kernel frond (aran) and palm kernel seed oil to scrub the body of the affected goat.

Mange poses the most pest affecting ruminants in Ekiti state. The result agrees with the finding of Kolawole *et al*. (2007) and Osho (2000), which uses palm oil to treat scabies (mange). Mange is caused by mites and sacroptic mange is the most common pest in Ekiti State. Palm oil is being used to treat mange in which the chemical ingredient inside it will react against the parasite causing the infection, thereby causing the regrowth of the lost hair and normal skin in the affected goat. Sarcoptic mange can be transmitted to humans, hence it has to be prevented at all times to prevent the transmission

Lice can be treated using *Ficus exasperata* and also palm kernel seed oil to scrub the whole body and the body will be shinning. Tick also affect goat and we can use pin to pinch it off or kerosene on the body. The tick can also attached to the eyes and it can be removed with hand/pin. Parasite in the hoof of the goat can be cured using kerosene and it can cause the goat to be limping and the one inside the nose can be cured using *Nicotiana tabacum.*

Tick and lice are vectors of diseases (Anaplasmosis and Rickettsal diseases) and they causes irritation, sores, wounds and provides means for secondary infections. Lice and tick can be treated using *F. exasperate and hand picking*, when placed in the house of the affected animal. This can be due to some ingredients or chemical constituents from the plant that will react against the lice and ticks, which will cause them to be scared away. Lice can also be treated using palm kernel seed oil, in which the chemical ingredient will react against the lice and kill it and cause the normal resurgence of the skin function and outlook and make them to shine better. Lice could also affect human hair. Other medicinal plants that could be used to treat this tick and lice include *Guireria senegalensis*, *K. senegalensis* and *Nicotiana tabacum*. Tick can be hand picked or to use pin. Tsetsefly is also a vector that causes trypanosomiasis that affect cattle. There can be introduction of integrated parasite management/integrated vector management in the treatment of these parasites.

38 types of ruminant diseases were identified by the respondents in the study area. The diseases were categorised into nutritional, microbial and environmental diseases. Of the 30 diseases conditions diarrhea was the most prevalent and caused serious economic losses. It can be treated by:

i. Using *Ocimum gratissmum*.
ii. Using Sand from the stream to rub the vulva to stop the stooling.
iii. Using *Chromolaena odorata* leave sqeeuze it and give it into drinking.
iv. You can also use squeeze *Ocimum Spp.* and give it in

Table 2. Respondents Indigenous Knowledge on Ruminant's Pests and Diseases in Ekiti State.

Indigenous Technical/ knowledge	Diagnosis	Diagnosis
Signs and or/Lesions	***English/Scientific Name***	***Vernacular Name***
A. Pest		
1. Sucks the blood of the animal.	Lice, ticks	Kokoro
- attached to the body of the animal		
- rubbing body on the wall		
2. The parasite is present on the body of the goat		
-There were whitish things on the body of the goat		
-Hair falling from the body		
- occur when the animal sleep in the ash	Mange/Sarcoptic Mange	Ekiku/ewu
- parasite borrow into the skin of the animal		
3.Parasite in the nose of the goat	Parasite	Kokoro imu
4. Parasite in the hoof of the goat	Parasite	Kokoro ese
5. Parasite in the mouth	Parasite	Kokoro enu
- Forming lesions in the mouth		
B Nutritional disease		
(i)Lack of appetite to eat	Fevea	Iba
- Choosing food to eat		
-Feeling restless		
(ii) Emaciation, palelook	Dizziness	Oyi oju
(iii) inadequate blood	Anaemia	Eje gbigbe
C. Microbial Diseases		
1.Paralysis of the animal Wound in the cleft and foot	Lameness	Rolapa/Rolese
1. Persistent watering stooling		
-depression, weakness and leaning of the animal		
-the sheep will be stooling if want to be pregnant		
2. Discharge of watery substances from the nose of the animal	Diarrhea	Igbe-guru
-Sneezing and coughing	Catarrh	Kata
3. Blisters of the vulva	Veneral diseases	Egbo oju ara
4. Discharge at The mouth, eyes and nose	Rinder pest	Awuku
-Raised hair coat		
- Common during rainy season		
5. Mouth foaming Saliva dropping from the mouth	Mouth foaming	Enu riru
6.Blisters in the mouth		Egbo lenu
-Swollen mouth		
-Sores in the mouth		
7. Coughing	Cough	Iko
8. Swollen part of the neck, stomach and leg		Orun ati ese wiwu
9. Toes become long		Ese gigun
10. - It makes the animal become thinner	Air diseases	Lukuluku
- It causes massive death of goat		
11. -Distension of abdomen	Bloat	Inu wiwu
-Off-feeding, no rumination		
- Laboured breathing		
12. Urinating small small		Atosi

Table 2. Contd.

D. Environmental diseases	Swollen body	Okuku
Goat-based diseases		
1. Swollen of the whole part of the body during rain		
2. Swelling on some part of the body		Ewo
3. Feeling cold	Cold	Otutu
- folding up		
-hair in the body standing up		
4. Difficulty to stool	Pile	Jedijedi
- Red vulva		
- Vulva came out		
5. Pains on the breast	Mastitis	Egbo omu
-unable to feed the young ones		
at birth		
-Area become swollen and painful		
-Parasites in the breast		
-Dried breast		
- Bumps in the breast		
-one breast bigger than the other		
- sores in the breast		
- one breast removed probably due to old age		
6. Prolong labour during parturition	Dystocia	Ailedabimo
- Some part or none of the foetus comes out		
-Animal unable to give birth		
7. Penis comes out		Oko yo sita
8. Sores in the ear		Ewo eti
9.Skin peel off		Ara sisi
10. Removal of the male genital organ because of the odour, to big and not to run away with the female.	Castration	Oko yiyo
11. Twisting of the neck	Botulism	Akeperan
- continous shouting		
-leads to death		
B Cattle –based diseases	Salt leaking	Isan enu
1. Mouth diseases: Salt leaking/Blisters in the mouth		
2. Disturbance of flies	Trypanosomiasis	
3. Lots of worm in the body	Helminthiasis	Aran
-Lack appetite		
-Emaciation and general body weakness		
- Worms coming out of the body		
4. Red bruises on the body during pregnancy		Guyan
5. Saliva dropping from the mouth of calf		Lukuluku
6. Ear dropping from the ear of calf		Tabu
7. Removing of hoof		Oru/tabu
-Injury at the tongues		
-inability to eat		
Removing of horn		
-occur during rainy season		
When the environment is dirty		
8. Twisting of the neck due to heat		Magestic
9. Coughing: Black body/Affects the heart		Ere
10. Body become thin		Farasa
-Black body		

drinking to the goat.
v. It can also be treated using orugegi leave.
vi. Also you can use *Aframomum meleguata* to scrub the vulva.
vii. You can also use agira made from *Nicotiana tabacum* with ogogoro and give it to the goat to drink.
viii. You can use epaijebu.
ix. You can also use salt and water.
x. The affected goat can be given bread to eat.

Botulism is a nutritional disease in which the animal will be twisting the neck and then start shouting which often leads to the death of the animal

The nutritional diseases identified were fevea; microbial diseases were diarrhea, cattrrh, cough, veneral diseases, mucus at the eyes and nose, mouth foaming, sores in the mouth, coughing, swollen neck, stomach and leg, toes become long, air diseases .

While environmental diseases identified are okuku, cold, pile, mastitis, swollen body, dytoscia, sores in the ear, skin peel off, castration, tabu, farasa, ere,salt leaking, trypanosomiasis, helminthiasis, lukuluku, guyan, saba, oru and managestis. Okuku can be treated in animal having it by placing them beside the fire, in other for them to get warm.

Retained placenta can be cured by giving the goat *Ficus thoningii or Spondia mombin* to eat or scrub the back of the goat. You can use kaun and water and give it in drinking to the goat. You can use clay to slash the vulva of the goat.

Cold can be treated using *Aframomum melegnata* and iyere give it in drinking. Also you can use agbo iba.

Red vulva can be treated using squeezing *Vernonia amygdalina, Ocimum Spp. and Citrus aurantifolia* to rub the vulva.

Parasite in the hoof/ wound in the leg use hot ash and *Citrus aurantifolia*, use it to rub the affected Microbial disease: The result also agrees with the findings of[8] which uses *Ocimum grattissimum* to treat diarrhea. Just as in human being. Diarrhea is caused by worms and anthelmintics are used to treat the worms. The active ingredient inside *O. grattisimum* contains Tannin which is anthelmintic and can react against the parasite causing the diarrhea and kill it and then restore the normal physiological function of the animal's body. Diarrhea also affects humans and at times the same medicinal plant is being used to treat it in humans, which shows that the research also has human impact. Diarrhea is a sign of pregnancy in sheep. Sheep are more resistant to diseases than goat, because of their higher immunity than goat.

Cattarrh often affect ruminants in the study area and is a viral disease of ruminant and it can be prevented by keeping infected animal from the healthy ones.

Rinder pest affect ruminants in the study areas and it is caused by morbillivirus. The normal treatment is the treatment of diarrhea.

Botulism: It causes great disaster in some locality of Ekiti state (Ikere and Ido). It is caused by toxin and bacterium called clostridium bacterium. The leave *of Tetrapleura tetraptera* is used to lie the neck and some palm oil is used to prevent the disease

Cold: It occurs mostly during rainy season and it affects most of the ruminants. It occurs when the body temperature falls to hypothermal i.e. when it is below the normal animals body temperature.

Nutritional diseases include: Fevea, anaemia. They often affect the ruminants in Ekiti state. A decoction of fruits leaves (agbo iba) is normally used to treat fevea. Just as in human beings. Sores in the mouth can be treated using locust bean to rub the mouth.

Environmental diseases include: Dystocia and Retained Placenta. They affect the ruminants mostly in Ekiti State and they were treated using *Spondia mombin* to aid parturition, probably because it contains lots of oxytocin to aid rapid contraction of the uterine wall.

Cold water is used to treat Oru, hot ash is used to treat lameness, Swollen body in animal can be treated by placing the animal near fire

Identification of Botanicals Used for Ruminants

Field observation revealed that a total of 51 plants belonging to 28 families were identified now as being used for the treatment of ruminant animal pests and diseases in the study areas (Table 3). The various plants parts such as leaves, fruits, seed, stem barks and root were utilized but the leaves constituted the bulk of the plant part used. Different parts of plants function differently e.g. leaves, fruit, seeds, bark and root. Some plants have parts that function differently e.g. leaves and seed of *Elaeis guinensis*

Medicinal Value of the Identified Botanicals used for the Treatment of Ruminants Diseases in Ekiti State

Table 4 shows the folk medico veterinary values of the identified botanicals for treating ruminant pests and diseases. Field observation revealed that indigenous knowledge on these botanicals was passed from one generation to another in the study area. The botanicals were perceived by the respondents as cheap, usually at low cost, locally and easily available and do not have side effects on their livestock. The most ailments of ruminants were treated using botanicals and they include: pest infestation e.g. mange, gastrointestinal problems e.g

Table 3. Identification Of Botanical Used For Ruminants.

Botanical Species	Family Name	Vernacular Name	Parts Used
1. *Aframomum melegnata*	Zingiberaceae	Atra-ire	Seeds
2. Agerantum conyzoides	Asteraceae	Imi-esu	Leaves
3. Amaranthus hybridus	Amarantheceae	Efo tete	Leaves
4. Amaranthus Spp	Amarantheceae	Efo igbagba	Leaves
5. Anacardium occidentale	Anacardiaceae	Kasu	Leaves
6. Aspilia africana	Asteraceae	Yunrinyun	Leaves
7. Bridelia ferruginea	Euphorbiaceae	Ira	Stem bark
8. Capscium frustescens	Solanaceae	Ata wewe	Fruit
9. Carica papaya	Caricaceae	Ibepe	Fruit
10. Caccia occidentale	Casealpinaceae	Kassia	Leaves
11. Centrosema pubescens Benth	Fabaceae	Centrosema	Leaves
12. Chromolaena odorata	Asteraceae	Akintola	Leaves
13. Citrus sinensis	Rutaceae	Osan	Leaves and fruit
14. Citrus aurantifolia	Rutaceae	Osan wewe	Fruit
15. Citrus spp	Rutaceae	Ganyinganyin	Fruit
16. Corchorous olitorius	Malvaceae	Ewedu	Leaves
17.Dioscorea spp	Dioscoreaceae	Isu	Tuber
18. Elaeis guinensis	Portulaceae	Ope	Leaves, fruit
19. Ficus exasperata	Moraceae	Eepinpin	Leaves
20. Ficus thoningii	Moraceae	Odan	Leaves
21. Ficus spp	Moraceae	Agbagba	Leaves
22. Ficus carica	Moraceae	Opoto	Leaves
23. Fluggea virosa	Euphorbiaceae	Ameranbiabo	Leaves
24. Giliricida sepium	Fabaceae	Agunmaniye	Leaves
25.Heliotropium indiaim	Boraginaceae	Igbekuko/Aparigun	Leaves
26. Hibiscus surattensis	Malvaceae	Fayanmora/Akonimora	Leaves
27. Hymenocadia acida	Hymennocardiaceae	Orupa	Leaves
28. Khaya senegalensis	Meliaceae	Oganwo	Bark
29. Lecaniodiscus cupaniodes	Sapindaceae	Okika	Leaves
30. Manihot esculentus	Euphorbiaceae	Ege	Tuber/root
31. Margaritaria discoidea	Euphorbiaceae	Awewe	Leaves
32. Momordica charantia	Curcubitaceae	Ejinrin	Leaves
33. Musa sp	Musaceae	Ogede	Leaves
34. Nicotiana tabacum	Solanaceae	Taba	Leaves
35. Nicotiana spp	Solanaceae	Taba ogbomu	Leaves
36. Ocimum gratissimum	Lamiaceae	Efinrin nla	Leaves
37. Ocimum spp	Lamiaceae	Efinrin aja	Leaves
38. Panguetina nigrescens	Periplocaceae	Ogbo	leaves
39. Pennisetum purpureum	Poaceae	Esisun	Leaves
40. Prunus dulcis	Rosaceae	Fruit	leaves
41. Pyrus calleryana	Rosaceae	Pear	Leaves
42. Solanum nodifiorum	Solanaceae	Odu	Leaves
43. Solanum spp	Solanaceae	Ewe abirikolo	Leaves
44. Spondia mombin	Asteraceae	Ekikan	Leaves
45. Thaumatococous danielii	Maranthaceae	Ewe oran	Leaves
46. Talinum traingulare	Portulaceae	Gbure	Leaves
47. Tetrapleura tetraptera	Fabaceae	Arindan	Leaves
48. Terminalia schimperiana	Combretaceae	Igi Idi	Leaves
49. Tithona diversifolia	Asteraceae	Ododo	Leaves
50. Vernonia amygdalina	Asteraceae	Ewuro	Leaves

Table 3. Contd.

51. Zea mays	Poaceae	Agbado	Seed
52.		Ororo	leaves
53.		Iyanapaja	leaves
54.		Amaradan	Leaves
55.		Orugegi	Leaves
56.		Olo	leaves

Botanical Species	Folk medicinal value
1. *Aframomum melegnata*	for treating cold
2. *Agerantum conyzoides*	for treating diarrhea
3. *Amaranthus hybridus*	for feeding the ruminants
4. *Amaranthus Spp.*	for feeding the ruminants
5. *Anacardium occidentale*	for feeding the ruminants
6. *Aspilia africana*	used for feeding and curing gastrointestinal diseases
7. Bridelia ferruginea	used for curing cough
8.*Capsicum frutescens*	used for curing cough
9.*Carica papaya*	for feeding the ruminants
10. *Cassia occidentale*	for feeding the ruminants
11. *Centrosema pubescens Benth*	for feeding the ruminants
12. *Chromolaena odorata*	used for treating diarrhea
13. *Citrus sinensis*	for feeding the ruminants; used to stop mouth foaming, poisoning used for treating mange
14. *Citrus aurantifolia*	for treating diarrhea
15. Citrus Spp	for feeding the ruminants used for curing mange, mouth foaming and posion.
16. Corchorous olitorius	for killing lice
17. *Dioscorea spp*	used to make goat look healthy and shiner
18.Elaeis guinensis	used for feeding the ruminants
19.Ficus exasperata	used for feeding the ruminants
20. Ficus thoningii	makes the ruminants to give birth to female
21. *Ficus Spp*	used for feeding the ruminants
22. *Ficus carica*	for treating diarrhea
23. *Fluggea virosa*	for curing pile: used to make goat look healthier and for knowing house when newly bought
24. *Giliricidia sepium*	used for curing cold
25. *Heliotropium indiaim*	for vitality
26. *Hibiscus surattensis*	used for curing eye problem
27.Hymenocadia acida	used for sound health
28. Khaya senegalensis	used for curing diarrhea and cough
29. *Lecaniodiscus cupaniodes*	used for feeding the ruminants
30. *Manihot esculentus*	used for killing parasite at the nose, for curing mange and catarrh
31.Margaritaria discoidea	used for curing mange
32. Momordica charantia	used for curing pile and diarrhea
33. Musa sp.	used for curing pile
34. Nicotiana tabacum	used for curing diarrhea
35. *Nicotiana Spp.*	used for feeding the ruminants
36.Ocimum gratissimum	used for feeding the ruminants
37. *Ocimum Spp.*	used for feeding the ruminants
38. *Panguetina nigrescens*	used for curing pile
39. *Pennisetum purpureeum*	used for curing pile
40. *Prunus dulcis*	used for aiding parturition
41. *Pyrus calleryana*	used for curing diarrhea
42. Solanum nodifiorum	
43. Solanum Spp	
44. Spondia mombin	

Table 4. Contd.

45. Thaumatococous danielii	for vitality
46. Talinum triangulare	for curing botulism
47.Tetrapleura tetraptera	for curing diarrhea
48. Terminalia schimperiana	for vitality
49. *Tithona diversifolia*	for curing worms
50. Vernonia amydalina	for feeding and curing diarrhea
51. Zea mays	for treating diarrhea
52. Ororo	for vitality
53. Iyanapaja	for sound health
54. Amaradan	for sound health
55. Orugegi	for curing diarrhea
56.Olo	

diarrhea, worms, reproductive diseases e.g. dystocia, retained placenta, respiratory tract problems e.g. cough, cold, catarrh, eye problem, urinary problem, mouth problem e.g. mouth sores, mouth foaming, vulva diseases e.g. pile, red vulva, excretory problem e.g. urinating small small, mammary gland e.g mastitis, eye problem e.g pus in the eye. Some medicinal plants are fed to the animal for vitality.

Citrus aurantifolia was used to cure cough (respiratory diseases) and poisoning. This shows that there some active ingredient in *Citrus aurantifolia* that can cure cough and neutralize poisoning in goat. The lime fruit is antiscorbutic (high in vitamin C). The delightful, tangy, citrus aroma of lime essential oil is used in aromatherapy to compliment or substitute for the lemon. *Citrus sinensis* are a healthy source of vitamin C and other nutrients, as well as one of the most versatile aromatherapy oils. Orange peel is used as a zest in cooking and as a tea. The liquid from the squeezing of *Manihot esculentus* was used to treat eye problem in goat which is in agreement with the study of Kolawole *et al*. (2007). The parasite causing eye problem could be cured using this liquid from the cassava. *Ocimum grattissmum*, *Vernonia amydalina* and *Momordica charantia* were used to treat diarrhea (gastrointestinal diseases) and pile. The use in the treatment of diarrhea was in agreement with the study of Mafimisebi *et al*. (2012), which shows antihelmintic effect of this plant in treating worms that causes diarrhea. *Hymenocadia sp., Talinum triangulare* and *K. senegalensis* were used for vitality and for treating cold. *Hymenocadia sp.* and *T. triangulare* were used to provide vitality which means they contain certain nutrients necessary for good health of the goat. *K. senegalensis* was serves to cure cold means that it provide some additional heat when the body temperature falls at hypothermal. The leaves of *Manihot esculentus, Eleais guinensis, Carica papaya, Anacardium occidentale*, *Amaranthus spinosus, Diosocera, Zea mays, Ficus carica* and *Prunus dulcis* were given to the ruminants as feed in the study areas. Extracts of the nut of *A. occidentale* contain naturally occurring analogs of the latest diabetes drugs. *C. papaya* fruit offers not only the luscious taste but is a rich source of anti oxidants. The leaf is used as a dewormer. The leave of *M. esculentus* is being used in treating *Haemonchus concortus* in sheep. *Ficus exasperata* was used as feed and for treating ectoparasites in the study areas. This was in agreement with the study of Carew *et al*. (1980). Dalzaij (1948) showed that it can be used in treating stomach disorders. *Musa sp.* was used as feed. *Chromoleana odorata* was used to treat diarrhea (Odugbemi, 2006).

Respondents Indigenous Knowledge on Preparation and Administration Used in the Treatment of Ruminant Animals Related Pests and Diseases in Ekiti State

In all the 51 botanicals, some were single-component preparation in which a single plant serves only one purpose or a single plant serving two or more purposes while others involved the combination of more than one medicinal plant (Table 5).

Some medicinal plants can serve to perform one medicinal function e.g *Musa sp.*, *Hymenocadia sp*., *Ficus thoningii* to feed the animal. A particular plant can serve two different medicinal purposes e.g. *O. grattissmum* in treating pile and diarrhea, *Nicotiana tabacum* in treating parasite at the nose and mange catarrh. This indicates that this plant is very sensitive to the cells at the nose and very effective in treating infections at the nose. This can indicate that drugs to treat infections or diseases at the nose can be made from this plant. While some are treated using combination of medicinal plants and ingredients e.g. Cold, catarrh, diarrhea

Some materials are used singly to treat ruminant diseases such as locust bean to treat mouth sores, epaigbebu to treat diarrhea. Some diseases can be

Table 5. Respondents Indigenous Knowledge on Preparation And Administration Used in the Treatment of Ruminant Animals Related Pests and Diseases In Ekiti State.

Botanical Name	Diseases Treated for	Recipes
1. *Aframomum melegnata*	for treating cold	Grind small quantity of it and mix with iyere and put it in the nose
2. *Agerantum conyzoides*	for treating diarrhea	Squeeze it and give the juice to the ruminant to drink
3. Amaranthus hybridus	Lack of vitality	The leaves are given to the goat to eat
4. Amaranthus spp	Lack of vitality	The leaves are given to the goat to eat
5. Anacardium occidentale	Lack of vitality	The leaves are given to the goat to eat
6. Aspilla africana	Lack of vitality	The leaves are given to the goat to eat
7. Bridelia ferruginea	Cough	Grind the bark of *Bridelia ferruginea* with locust beans and pepper and give the ruminant to eat
8. Capscium frustecens	Cough	Use it in decoction with *Bridelia ferruginea and locust bean*
9. Carica papaya	Lack of vitality	The fruit peeled and given to the goat to eat
10. Cassia occidentale	Lack of vitality	The leaves are given to the goat to eat.
11.Centrosema pubescens Benth	Lack of protein	The leaves are given to the goat to eat.
12. Chromolaena odorata	Diarrhea	The leaves are squeezed and the extract given to the goat
13. Citrus sinensis	Lack of vitality	The leaves and the fruit peel given to the goat
14. Citrus autrafolia	(i) for curing mouth foaming	Squeeze the juice into the mouth of the goat
	(ii) for curing pile	Cut it into two and use it to rub the bottom of the goat
	(iii) for curing cough	Use the juice in decoction with ora (red) grind and give it to the goat to drink
	(iv) Urinating small small	Squeeze the juice and give it to the goat to drink. Palm kernel wine can also be used to cure the diseases
15. Citrus spp	Mange	The juice is used to rub the body of the affected goat
16. Corchorous olitorius	Diarrhea	Squeeze small amount of the leaves with ororo leave and give the juice to the goat to drink
17. Dioscorea spp	Lack of vitality	The peels of the yam are given to the goat to eat
18. Elaeis guinensis	(i) Mange	- Shaft of palm kernel fruit (made by squeezing of the palm oil from the fruit but not in water) is used to scrub the back of the goat -concotion of palm oil plus ori and palm kernel oil to give it in drinking and to rub the body -use aran and shaft of palm kernel fruit to rub the body of the affected goat -Use palm oil and salt and husk of maize to scrub the body of the affected goat
	(ii) Mouth foaming	Give the goat palm oil to drink
	(iii) Cough	Give the goat palm oil / palm kernel oil to drink
	(iv) Feeding	Give the goat the leaves to eat
	(v) Red vulva	Use ori and palm kernel seed oil to rub the vulva.
19.Ficus exasperata	(i) Lice	Collect the fresh leaves and place inside the goat /rams house to scare the lice away
	(ii) Mastitis	-Place aran from palm tree in their house to scare the lice away Use the leaf to rub the affected breast
20. Ficus thoningii	Sound health and shinny skin	Collect the fresh leaves and give the goat to eat
21. Ficus spp	Lack of vitality	The leaves are given to the goat to eat
22. Ficus carica	Lack of vitality	The leaves are given to the goat to eat
23. Fluggea virosa	Inability to give birth to female	The leaves are given to the goat to eat
24. Giliricida sepium	Lack of vitality	Collect fresh leaves and give it to the goat to eat
25. Heliotropium indiaim	Diarrhea	Squeeze the leaves and give the extract in drinking to the goat
26. Hibiscus surattensis	pile	Squeeze the leaves and give the extract in drinking to the goat
27. Hymenocadia acida	Lack of sound health	Collect fresh leaves and give it to the goat to eat

Table 5. Contd.

28. Khaya senegalensis	cold	Decoction of the bark of *Khaya senegalensis* with grinded pepper and then given orally to the goat
29. Lecaniodiscus cupaniodes	Lack of vitality	The leaves are given to the goat to eat
30. Manihot esculentus	Pus in the eyes	Squeeze the juice from the tuber of *Manihot esculentus* and put it into the eyes of the affected ruminants
31. Margaritaria discoidea	Lack of vitality	The leaves are given to the goat to eat
32.Momordica charantia	(i) Diarrhea	Squeeze *Momordica charantia* and also *Ocimum gratisimum* give the extract to the goat to drink
	(ii) Pile	Squeeze the leaves and give it in drinking to the affected goat and use it to slash the vulva
33. Musa spp	Lack of vitality	The leaves and fruit are given to the goat to eat
34. Nicotiana tabacum	(i) Mange	Squeeze the juice of *citrus spp* and add kanun and add fresh leaves of *Nicotiana tabacum*, then use it to rub the back of the goat
	(ii)Parasite at the nose	-Use the fresh leave of *Nicotiana tabacum* to rub the body Squeeze fresh leaves of *Nicotiana tabacum* and put it in the nose of the goat to kill the parasite
	(iii) Catarrh	Use Apadi (broken mud block) grind it with *Nicotiana tabacum* and add iyere and put it into the nose and snuff it into the brain
	(iv) Diarrhea	Dry the leave and grind and give it to the goat.
35. Nicotiana spp	Mange	Same as above
36. Ocimum gratissimum	(i) Pile	Squeeze fresh leaves *of Ocimum gratissimum* and put it into the mouth and also use it to rub
	(ii) Diarrhea	the vulva of the goat or give it to the goat to ea - Squeeze *Ocimum grattissmum* and *Nicotiana tabacum* give the juice to the goat
	(iii) Cough/cattarrh	Use fresh leaves of Olo and *Ocimum gratissimum*, squeeze it and give it to the goat to drink
		Use fresh leaves of *Ocimum gratissimum and Momordica charantia* and the extract given to the goat to drink
37. Ocimum spp	Pile	Same as above
38.Panguetina nigrescens	Diarrhea	Squeeze the leaves with *Ficus thoningii* and give it in drinking to the goat
39. Pennisetum purpureeum	Lack of vitality	The leaves are given to the goat to eat
40. Prunus dulcis	Lack of vitality	The leaves are given to the goat to eat
41.Pyrus calleryana	Lack of vitality	The leaves are given to the goat to eat
42. Solanum nodifiorum	Pile	Squeeze fresh leaves and use it to slas the vulva
43. Solanum spp	Pile	Same as above
44. Spondia mombin	(i) Dytoscia	Collect fresh leaves and put it or not into the fire and give it to the goat to eat
	(ii) Retained placenta	Give the goat to eat
45. Thaumatococous danielii	Lack of vitality	Collect fresh leaves and give it to the goat to eat
46. Talinum triangulare	Lack of vitality	Collect fresh leaves and give it to the goat to eat
47. Tetrapleura tetraptera	Botulism	Tie the leave around the goat's neck and give the goat palm oil to drink
48. Terminalia schimperiana	Diarrhea	Boil the leaves with olo and aji and give it to the goat to drink
49. Tithonia diversifolia	Lack of vitality	The leaves given to the goat to eat
50. Vernonia amygdalina	(i) worms	Collect fresh leaves and give it to the goat to eat Make an extract and give it to the goat to drink
	(ii) red vulva	Squeeze the leaves of *Ocimum gratissimum and Vernonia amygdalina* and use it to slash the vulva.
51. Zea mays	Diarrhea	Seeds roasted and given to the goat to eat
52. Ororo	Diarrhea	The extract of the leaves of ororo and *Corchorous olitorius* given to the goat to drink

Table 5. Contd.

53. Iyanapaja	Lack of vitality	Collect and give it to the goat to eat
54. Amaradan	Lack of vitality	Collect and give the goat to eat
55. Orugegi	Diarrhea	Squeeze it and give it in drinking to the goat
56. Olo	Diarrhea	Use decoction of idi tree and olo and aji, boil and give it in drinking to the goat

treated using different means/ ways e.g. Mange and diarrhea. Some different parts of the plants can perform different functions in treating different types of diseases e.g. Fruit of *E. guinensis* ,leaves of *N. tabacum*, bark *of K. senegalensis*. Different components of the same plant part might be used for different purposes e.g. *E. guinensis*, the fruit can be used to treat mange while the leaves can be used to feed the goat; *C. papaya* fruits and leaves; *Musa sp. f*ruits and leaves.

A particular disease can be treated using different plants e.g. *O. grattissmum* and *Solanum nodifolium*, in treating pile, diarrhea, red vulva and cough.

Different locality have specific medicinal plants specific for them to use to treat ruminant diseases. e.g. ikole used *S. nodiflolium* to treat pile while ijero used *O. grattissmum* to treat pile

There are different ways of administration/application of medicinal plants e.g. Some are squeezed and applied orally (*O. grattissmum*), some are placed around the animal's house (*F. exasperata*) while some are applied subcutaneously e.g. *Citrus Spp.* to scrub the body of goat affected with mange.

The parasitic diseases can be treated using medicinal plants e.g. mange, lice and parasite at the nose while microbial diseases such as cold, pile can also be treated using medicinal plants. Also nutritional diseases such as lack of appetite, inadequate consciousness can also be treated using medicinal plants.

A particular disease can be treated using different medicinal plants e.g. Diarrhea can be treated using *O. grattissimum* and *Mormodica charantia* which agrees with the study of Mafimisebi *et al*. (2012). Some medicinal have been used to treat a particular disease or use different combination of medicinal plants or use singly materials to treat diseases (Rahmatullah *et al*., 2010), this is also applied in this study.

Challenges Facing Cattle Rearing in Ekiti –State

There were no veterinary office in some places of Ekiti State like Ise oru and Emure. Some cattle rearers in Ado-Ekiti area are poor and cannot afford the cost of veterinary clinic and lack veterinary care; lack transportation means to carry their diseased cattle to veterinary office; field veterinarian to give advice and guidance about cattle management; some cattle that have diseases that do not have drug e.g Guyan, Saba/ Lukuluku, they depend mostly on local drugs for treating there cattle rather than modern drugs mostly and they treat there cattle by them selves

Suggested Solutions to Cattle Rearing in Ekiti State to Enhance Cattle Productivity

Government should provide veterinary office/officer in some places of Ekiti State. Government should provide funds for cattle rearer to have veterinary care that will better enhance their management. They can practice cross breeding in Ekiti State to better improve the breeds of cattle that will be resistant to trypanosomiasis which is common in Ekiti State. People should donate some reserved areas for pasturing for the cattle in Ekiti State.

Conclusion

Ethnoveterinary medicine has remained the major practice to the remedy of ruminant diseases among rural people in developing countries. The respondents need to be more educated on the use of ethnoveterinary medicine. Mange and diarrhea were the most pest and diseases affecting the respondent in the study areas. The medicinal plants are cost effective and easily available to the respondents to be used for treatment of diseases compared to orthodox medicine. Some of the method of administration of the indigenous knowledge include the use of palm oil to cure mange, use of *Bridelia ferruginea* and *Capscium frustecens* to cure cough, use of *C. odorata* to cure diarrhea. Pastorals in the state should be assisted with medical care for their cattles and should be provided with veterinarians to help mostly in the areas where they were absent. But the presence of the medicinal plants at every seasons and support from the government and its institutions can enhance effective use of these ethnoveterinary practices. For sustainable development, indigenous knowledge could be integrated into western knowledge system. Moreso, there should be biodiversity conservation and validation of the findings from these study.

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